pools, which become ponds in dry weather. This northern country opposite to Greenland has been "carved" in this fashion by ice on the large scale, and afterwards by water-streams, and by the frequent falling of rain drops. It has also risen from the sea. The ice-cover has been taken off Scandinavia and Finland, and there it is possible to test theories about the work which an ice-cover is now doing on the present chief gathering grounds of snow throughout the world. But that Scandinavian work is the same kind of work which is found with small glacial marks elsewhere. Hollows have rounded sections ⌣, or when deep they are like U. Hills between hollows commonly are hog-backs ⌒, and generally the land is rounded, except where peaks rise, and cliffs have broken. But this kind of rounded sculpture exists only in some regions of the world, and it marks the site of local glacial periods, as I believe. Elsewhere the section of valleys is angular like V, or in cañon countries like Y. These angular grooves are known to be the work of streams, because every stream of water carves on the same plan. Rounded hills and dales are at first sight evidence of powerful ice erosion, but some kinds of rock weather in bosses. If it be admitted that a drop wears a stone, that a stream makes a deep cañon in a long time, and that a glacier "abrades" or makes any mark at all, it seems to follow that an ice-engine as large as India or Scandinavia has in fact done the large work which it might be expected to do by perseverance in working, as it is known to work, wherever snow now gathers in large masses. Given the hardly perceptible wearing of water and time, a cañon a mile deep and many hundreds of miles long has resulted from the flowing of a stream. Given glacial "abrasion" and time enough, than valleys of rounded section, and firths and lake-basins of a particular kind probably resulted from the flowing of ice.

There are plenty of hollows in the earth's surface which are not the result of erosion but of other causes with which I am not now concerned. Where a stream flows from source to mouth on a gradual slope, there has been no great disturbance of level since the stream began to work. Where ice fills the dales there are no cañons. Where ice has filled dales and has left fresh marks, cañons are short and small. In mountain regions where ice-marks are rare or absent, cañons are of great depth and length, apparently because their streams have flowed in the same channels ever since the mountains were raised. But where cañons are marked features, these lakes, firths, and dales of rounded section are very rare, or do not exist. It seems therefore that hollows which have, in fact, been carved out of the earth's surface may be known for water-work, or for ice-work by their shape, and that firths, dales, and lakes may mark the sites of local glacial periods; and cañons the sites of climates that have not been glacial since the streams began to flow. Perseverance may accomplish great results insensibly like ice in dales, water in water-courses, and drops on stone.

Let me counsel those who wish to study the works of ice on a large scale to abandon the retiring glaciers of Switzerland and study Nature in Norway. This is the best season for travelling there. J. C.

June 23

The Loan Scientific Collection at South Kensington

As a science teacher, privileged to attend the special demonstrations upon the extraordinary assemblage of apparatus now filling the galleries of the exhibition buildings, a list of some of which appeared in last week's NATURE, would you allow me to call attention to the provision of the department by which the general public may be admitted, if room, at a nominal charge.

Within the past few days my note-book shows that the original instruments of Sir Isaac Newton, Faraday, Fizeau, Wheatstone, Watt, Savery, Black, Cavendish, Guericke, and others employed in their classic researches, have been shown and explained (and used, so far as experimentalists would presume to touch such now almost venerated relics).

The spacious and well-appointed lecture-theatre has not been always crowded; but I have the impression that if the above regulation were widely understood there would be such a gathering, not of the merely curious, who would attend as at an entertainment in natural magic, but of those deeply interested in the topics discussed, as would prove too large for the accommodation at present provided; and, whilst scientific enrichment of the public would be more largely secured, a compliment would at the same time be paid to the directors for their great efforts to promote the success of this important undertaking.

The School of Science, July 6 WILLIAM GEE

Evolution of Oxygen by "Vallisneria Spiralis"

HAVE any of your readers noticed the rapid evolution of oxygen by a blade of *Vallisneria spiralis?* If a blade is cut or broken and held under water, the bubbles of gas are rapidly noticed issuing from the broken end, and by a simple arrangement of placing the broken blade or several blades into a test tube filled with water the water is displaced and the gas collected. After forty-eight hours the pores of the broken end of the blade close up and a fresh fracture is necessary to restore the evolution of gas, which also ceases at night only to recommence when the sunlight reappears. I have collected about a cubic inch of gas in eight hours from one blade of the plant. A confirmation of my experiment would please me.

Stroud, July 3 WALTER J. STANTON

Stamens of Kalmia

IF the beautiful spring trap formed by the stamens of the Kalmia, by which insect fertilisation is secured, has not yet been noticed, I may perhaps be allowed to call attention to it.

Cahirmoyle, Ardagh, Co. Limerick C. G. O'BRIEN

Optical Phenomenon

FOR more than half an hour after sunset this evening there was a broad band of light rising vertically through a clear sky immediately above where the sun had set. It moved as the sun moved northward below the horizon, retaining its vertical position. It must have been formed at a very great height in the atmosphere, for it outlasted all the other sunset tints, which were very beautiful. It would be interesting to know whether this was seen from many places far apart. JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, June 27

The Cuckoo

WITH regard to the letter of Mr. Adair, in last week's NATURE, p. 210, on the cuckoo, I have only to observe that if it does not sing in Somersetshire after Midsummer it does *here*, in Middlesex; I heard it, to my astonishment, early in the morning of the 6th inst., in the woods and hills to the north. I never recollect its note so late, not after the 3rd.

Harrow, July 10 HENRY ST. JOHN JOYNER

OUR ASTRONOMICAL COLUMN

SHORT'S OBSERVATION OF A SUPPOSED SATELLITE OF VENUS.—This observation which, as it appears in the *Philosophical Transactions*, vol. xli. (NATURE, vol. xiv., p. 194), is mystified by a typographical error, is also found in "Histoire de l'Academie des Sciences, 1741," p. 125, where the micrometrically-measured distance of the suspicious object from Venus is given in what seems to be a more correct form, and as it was used by Lambert in his calculations. After referring to the observations of the elder Cassini in 1672 and 1686, the writer—probably Cassini II., author of "Elemens d'Astronomie"—states that Mr. Short had again seen the satellite, real or apparent, in the preceding year (1740), under similar circumstances, and with the same phase as Cassini had described; he had been informed of this in January, 1741, by M. Coste, "auteur de la Traduction du livre de l'Entendement Humain de Locke, et de plusieurs autres ouvrages;" and having communicated the observation to the Academy of Sciences, had been charged by that body to inquire more particularly concerning it, and report the result. But as Short had not seen the satellite again up to June, 1741, nothing further was ascertained than had been notified in the letter addressed to M. Coste, which was from "Mr. Turner, written from London, June 8."

Short's observation was "made in London, November 3, 1740, in the morning, with a reflecting telescope of 16½ English inches, and which magnified the diameter of the object from fifty to sixty times. He perceived at first what appeared to be a small star very near to Venus, upon which, having applied to his telescope a stronger eyepiece and a micrometer, he found the distance of the

small star from Venus, 10 minutes 20 seconds. Venus then appeared very distinctly, and the sky being very clear, he took eyepieces three or four times more powerful, and saw, with an agreeable surprise, that the small star showed a phase, and the same phase as Venus; its diameter was rather less than a third of that of Venus, its light not so vivid but well defined; the great circle which passed through the centres of Venus and of the satellite, which it would be difficult to designate otherwise, made an angle of about 18 to 20 degrees with the equator, the satellite being a little towards the north, and preceding Venus in right ascension. Mr. Short examined it at different times and with different telescopes during the space of an hour, until the light of day or of the twilight obliterated it entirely."

It will be seen that Short's observation, divested of the typographical error in the *Phil. Trans.*, by which it was confused, is intelligible enough, and it may not be without interest if we examine the circumstances under which it must have been made.

Taking the place of Venus with sufficient precision for the purpose in view from the tables of Le Verrier, we have the following figures :—It may be premised that the date given in NATURE last week from the *Phil. Trans.* is the morning of October 23, but it is to be remembered that the Gregorian style had not then been introduced in this country; in the present mode of reckoning, it becomes the morning of November 3, as stated in the "Histoire de l'Academie."

G.M.T.	Venus, App. R.A.	App. N.P.D.	Dist. of Venus from the Earth.
1740, Nov. 2, at $18^h\ 30^m$	175° 21′ 11″	87° 12′ 21″	0·7007.

Hourly motion in R.A. + 2′ 28″; in N.P.D + 0′ 49″.

The apparent diameter of Venus (Le Verrier) was 23″·7, and her heliocentric longitude being 86° 11′, and her geocentric longitude 174° 38′; the breadth of the illuminated portion of her disc was 0·514; elongation, W. 46½°.

Short says the daylight put a stop to his observations "about a quarter of an hour after eight," which we may assume to imply apparent time, and as the correction from apparent to mean time was then $16^m{\cdot}1$ subtractive, his observation may be supposed to have terminated at 8 A.M., and as he had viewed the object during the space of an hour, we find Venus must have been at an altitude of 36° when he first perceived it, and further, it should be noted, the sun rose at $7^h\ 0^m$, so that Short's observations must have been made entirely in daylight, with the planet particularly well situated.

The suspected satellite was 18°–20° north-preceding Venus, which implies a mean angle of position of 289°, and as the distance was 10′ 20″, we have for the difference of right ascension, $39^s{\cdot}1$, and for the difference of N.P.D., 3′ 22″. Supposing these differences to apply to $7^h\ 30^m$ A.M., the position of the object would be R.A. $11^h\ 40^m\ 50^s{\cdot}6$, N.P.D. 87° 9′ 23″; whence, bringing forward to the epoch of the *Durchmusterung*, its R.A. is $11^h\ 46^m\ 46^s$, N.P.D. 87° 47′·5 for 1855·0.

Unless we had been able to correct the misprint in the *Phil. Trans.* by the French account of the observation, it might, perhaps, have been inferred that the distance was intended to be 1° 2′ or 1° 12′, and in this case the 3.4 magnitude star β Virginis would have fallen very nearly upon Short's position; at 7 A.M. this star preceded Venus 1° 5′, and was N. 26′.

It will be found that our examination of Short's observation does not tend to explain it. Though Lalande thought when conversing with him on the subject in 1763, that he doubted his having observed a satellite of Venus, he appears to have been sufficiently impressed with his observation to have had the appearance engraved, and to have "carried it with him as a seal."

The observation of Andreas Mayer at Greifswald, mentioned in NATURE last week in the notice of Schorr's "Der Venusmond," was communicated to Lambert after the appearance of his memoir "Essai d'une théorie du satellite de Vénus," in the Berlin Memoirs, 1773, of which an abstract is found in the *Astronomisches Jahrbuch*, 1777. It is printed at p. 186 of the *Jahrbuch* for 1778, where also appear the two letters from Abraham Scheuten to Lambert, referring to his observations of what he believed to be a satellite of Venus, *after* the planet had left the sun's disc in the transit of 1761, June 6, which at noon at Crefeld was near the centre of the disc and at 3 P.M., near the limb. Lambert follows with a particular examination of Scheuten's observation in connection with the observations of Montaigne at Limoges in May preceding.

γ ARGUS.—Gilliss, in the notes to the 1850 "Catalogue of Double Stars observed at Santiago," remarks of this object: "The cluster deserves special attention for its evident changes since Herschel's observations." From a comparison of the observations it is not obvious to what changes reference is here made. Perhaps some reader of NATURE who can favourably command this star's position will describe the actual configuration, &c., of the principal star and *vicinæ*.

Mr. S. M. Drach writes with reference to views of binary stars from Venus and Mars: "Has it ever been noticed by cosmographists that an observer at these planets must see our moon at a maximum elongation-angle from our earth, ranging from Venus from $5\frac{1}{11}$ to $31\frac{1}{4}$ minutes of degree, and from Mars from $3\frac{1}{2}$ to $16\frac{5}{8}$ minutes of degree, whence follows that our *present century's* certitude of Binary Stellar Systems is a PRIMITIVE feature of naked-eye astronomy to the Venus or Mars observers. This elongation diminishes to zero in about seven days of either planet, since their rotation periods nearly equal the earth's."

THE NORWEGIAN-ATLANTIC EXPEDITION

THIS Expedition left Bergen June 1 for the Sognefiord, where the first week was spent in preparatory work—sounding, dredging, and trawling in 600 fathoms. The temperature at the bottom was found exactly the same as in former years, 43°·7 F. The fauna was a mixture of Atlantic and Arctic. There were found several specimens of *Brisinga coronata* (Sars), *Munida tenuimana*, one large *Actinia* and a sponge, *Tisiphonia agariciformis*, and, among other mollusca, *Aximus eumyarius* (Sars), *Kelliella abyssicola* (Sars), *Malletia obtusa*, and *Taranis Mörchi*. The second week was spent at Hüso, a small island at the mouth of the Sognefiord, where magnetical base-observations were made on shore and on board, ship swung for deviation, &c.

June 20 the Expedition left this place, and steered along the deep channel surrounding Southern Norway from the Skagerrack up to Cape Stadt. The first soundings and dredgings showed a very flat bottom at a depth of about 200 fathoms, and with a fauna mainly Atlantic. About 150 miles N.W. of Cape Stadt the temperature began to fall, the depth remaining unchanged. At the next sounding the depth increased and the bottom temperature was still falling, until at last the Miller-Casella thermometer showed 32° at 300 fathoms, and 30° at the bottom in 400 fathoms. This is exactly like what the *Porcupine* found in the *Lightning* Channel. Off Stadt the fauna was Arctic and Glacial. Among the specimens brought up was a gigantic *Umbellularia*, 5 feet high, a *Nymphon*, 10 inches between the ends of the feet, a new large *Archaster*, and many other characteristic forms. No less than eight forms of Hydroids were also found at this depth, three different species of Arctic *Fusus*, and several specimens of *Yoldia intermedia*, &c.

The Expedition ran into Christiansund June 23, and was to leave that port in a few days for the Faroes and Iceland.